

App. No. 10/709,877  
Amendment dated October 13, 2005  
Reply to Office Action of July 13, 2005

**Amendment to the Drawings:**

The attached sheets of drawings include changes to Figures 1, 2A, and 2B. The replacement sheets include the addition of the legend "Prior Art" to each of Figures 1, 2A, and 2B.

Attachment: Replacement Sheets with Figures 1, 2A, and 2B.

## **REMARKS/ARGUMENTS**

Applicants will respond to the various items in the office action in the order they are presented.

### **Drawings**

The Examiner has required that Figures 1, 2A, and 2B should be designated by a legend such as "Prior Art." Replacement sheets incorporating the required change are attached to this Response.

### **Claim Amendments**

Claims 1 and 7 have been amended in accordance with the Examiner's suggestion to reflect that the different groups of injectors are controlled independently from one another. Claim 3 has been amended to simplify the language indicating the requirement that the groups of fuel injectors have the same number of injectors in each group. Claim 11 has been amended to emphasize that in the method the injectors are distributed radially around the combustion chamber. Claim 13 has been added to note that the timing of the duty cycles of each group of injectors are staggered. Claim 14 has been added to note that in the apparatus the injectors are distributed radially around the combustion chamber. With these amendments, Applicant submits that the invention is more fully characterized.

### **Claim Rejections - 35 U.S.C §102(b) or 35 U.S.C. §103(a)**

The Examiner has rejected claims 1 – 12: "...under U.S.C. 102(b) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as being obvious over Paschereit 2001/0027638 A1 that teaches the invention as disclosed and as claimed: A gas turbine and

method of controlling its fuel injection having at least two independently controlled fuel lines 13, 14, wherein the fuel is pulsed through said lines independently of each other....each line being controlled by one valve each in response to input to a control unit from an appropriate time-dependent sensor...”

Applicant respectfully submits that Paschereit neither anticipates nor renders Applicant's invention obvious and in support thereof presents the following arguments. As a first point of departure, Applicant notes that the Examiner characterized Paschereit's disclosure as teaching “at least two independently controlled fuel lines.” Claim 1 of Paschereit specifically recites two fuel lines, no more and no less. Applicant's invention utilizes fuel injectors each with an independent supply of fuel. In Applicant's invention, there is no common valve regulated fuel line which feeds the different banks of injectors. Using the meaning ascribed to “fuel line” by Paschereit to describe the minimum requirement of Applicant's invention, requires at least four fuel lines the at least four injectors of Applicant's invention. Paschereit can not anticipate a device with at least four fuel lines. Further, absent some teaching or suggestion that more than two fuel lines and their associated fuel openings (15) could be utilized in the system of Paschereit, Paschereit can not render Applicant's invention obvious.

Second, and more importantly, Paschereit describes a system and method where the volume of fuel supplied to the engine is modulated in pulses (increased) above a baseline level. However, at no time may the fuel flow be completely turned off. Paschereit teaches that a minimum fuel flow is required to sustain combustion since no fuel flow would lead to the combustion flame being extinguished. In Paschereit's system and method, a certain minimum

amount of fuel is continuously sprayed into the chamber. See for example Paschereit paragraph 0026. This requirement is also explicitly reflected in Paschereit's claim 2 where Paschereit notes that, "in addition to a constant quantity of premix fuel", fuel is additionally sprayed in pulses.

One of the features of Applicant's invention is the fact that at times the fuel supply is completely shut off. As long as the duty cycle for two groups of injectors is less than 50%, there will be a time when no fuel is being injected. Similarly, for three groups of injectors, there will be no fuel flow when the duty cycle is less than 33%, for four groups, a duty cycle of less than 25%, and so on for more groups of injectors. Paschereit does not anticipate nor render obvious this feature of Applicant's invention. In fact, Paschereit teaches directly away from Applicant's invention by requiring that there always be a minimum amount of fuel continuously sprayed into the chamber.

A third reason that Paschereit can neither anticipate nor render obvious Applicant's invention arises from the very different nature and purpose of the two inventions. Paschereit is directed to minimizing the pressure amplitude of thermoacoustic vibrations that may arise in the combustion chamber and modulates the spraying of fuel into the chamber above a constant level to achieve his result. Pulsation of the additional fuel flow is on top of whatever the amount of fuel is that is being supplied constantly to meet the power requirements. Paschereit's modulated additional fuel is not used to control the power output of the turbine engine.

Applicant's invention, on the other hand, is explicitly designed to regulate the power output of the engine. Longer pulses of fuel are used for higher power output. The total amount of fuel required for a given power output is divided over the number of injectors operated in groups.

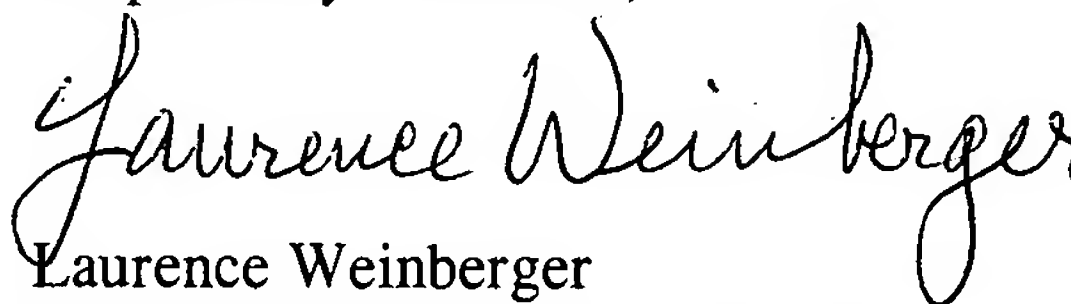
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Clearly, Paschereit's teaching of minimizing thermoacoustic vibrations neither anticipates nor renders obvious Applicant's utilization of injector groups to control the power output of the engine.

Applicant submits that the above arguments overcome the bases for the Examiner's rejections of the claims, and that with the amendments to the claims, the application is now in condition for allowance. While two new dependent claims have been added in this Response, no additional claim fees are due. Applicant respectfully requests that the Examiner withdraw the rejections of record and permit the application to issue.

October 13, 2005

Respectfully submitted,

A handwritten signature in cursive script that reads "Laurence Weinberger". The signature is written in black ink and is positioned above the printed name and contact information.

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